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EXAMINER	
OCHOA, JUAN CARLOS	

ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 05/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/645,705	HARTMANN ET AL.
	Examiner	Art Unit
	Juan C. Ochoa	2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 22 August 2003.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-47 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-47 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 22 August 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 8/22/03&1/26/05.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-47 are presented for examination.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

3. The following title is suggested: Accuracy Improvement Of Aircraft Performance Predictions.

Claim Objections

4. Claims 1–6, 18, 23–26, 38, and 44–47 are objected to because of the following informalities:

5. Claims 1–6, 23–26, 38, and 44–47 use the acronyms “N1, N2, EPR” and/or “PLA”, the first use of an acronym in a claim should be defined to avoid any possible indefiniteness issues.

6. Claims 18 and 38, line 7 includes the miss conjugated term “have”. Examiner interprets as “has" for examination purposes.

7. Appropriate correction is required.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 1, 21, and 41–43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adibhatla et al., (Adibhatla hereinafter), U.S. Patent 6,466,858 B1, taken in view of Smith et al. (Smith hereinafter), U.S. Patent 5,606,505 A.

12. As to claim 1, Adibhatla discloses a method for enhancing a model of an aircraft comprising: computing a thrust estimate from data measured from at least one engine sensor (see "estimate ... thrust" in col. 2, lines 58–60, and Fig. 1, item No. 70); and adding the thrust estimate to the model (see col. 3, lines 50–54, and Fig. 1, item No. 74).

13. While Adibhatla discloses a model of an aircraft, Adibhatla fails to specifically disclose a thrust-minus-drag mathematical model.

14. Smith discloses a thrust-minus-drag mathematical model. (See "modeled thrust-minus-drag relationship" in col. 3, lines 45–49).

15. Adibhatla and Smith are analogous art because they are both related to flight management systems.

16. Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to utilize the thrust-minus-drag model of Smith in the method of Adibhatla because Smith predicts performance of an aircraft by modeling mathematically thrust-minus-drag using aircraft data and input parameters (see col. 2, lines 40–45), and as a result, Smith reports the following improvement over his prior art: predictions of greater accuracy than those depending on explicit knowledge of thrust and drag separately (see col. 2, lines 46–54).

17. As to claim 21, Adibhatla discloses a method for modeling the performance characteristics of an aircraft comprising: computing a thrust estimate from data measured from at least one engine sensor (see "estimate ... thrust" in col. 2, lines 58–60, and Fig. 1, item No. 70); and adding the thrust estimate to the model (see col. 3, lines 50–54, and Fig. 1, item No. 74). While Adibhatla discloses modeling the performance of an aircraft, Adibhatla fails to specifically disclose a thrust-minus-drag mathematical model and computing the model from measured fuel flow data, measured air data, measured attitude and acceleration data and pilot entered data. Smith discloses a thrust-minus-drag mathematical model (see "modeled thrust-minus-drag relationship" in col. 3, lines 45–49) and computing a thrust-minus-drag mathematical model from measured fuel flow data (see col. 12, line 48), measured air data (see col. 12, lines 43–45), measured attitude (see "pitch and roll" in col. 12, lines 45–46) and acceleration data (see col. 12, lines 46–47) and pilot entered data (see col. 7, lines 22–24).

18. As to claim 41, Adibhatla discloses a system for mathematically modeling the performance characteristics of an aircraft comprising: a maximum fuel flow rating filter, whose outputs are used in performance prediction (see col. 3, lines 42–45); and a mathematical engine model, wherein the engine model receives engine performance data (see "modeled" in col. 3, lines 45–49). While Adibhatla discloses system for mathematically modeling the performance characteristics of an aircraft, Adibhatla fails to specifically disclose a thrust-minus-drag mathematical filter. Smith discloses a thrust-

minus-drag filter, whose outputs are used in performance prediction. (See "thrust-minus-drag relationship" in col. 3, lines 45–49).

19. As to claims 42 and 43, Adibhatla discloses thrust-minus-drag and fuel flow rating filters as a Kalman filter. (See col. 3, lines 45–49).

20. Claims 2 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adibhatla taken in view of Smith as applied to claims 1 and 21 above, and further in view of Adibhatla et al., (Adibhatla (2) hereinafter), U.S. Patent 6,502,085 B1.

21. As to claims 2 and 22, while the Adibhatla–Smith method teaches enhancing a model of an aircraft by computing a thrust estimate from data measured from at least one engine sensor, the Adibhatla–Smith method fails to disclose the thrust estimate added to the thrust-minus-drag mathematical model only during an aircraft cruise condition.

22. Adibhatla (2) discloses a method wherein the thrust estimate is added to the thrust-minus-drag mathematical model only during an aircraft cruise condition. (See "cruise " in col. 1, lines 44–47).

23. Adibhatla, Smith, and Adibhatla (2) are analogous art because they are related to flight management systems.

24. Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to utilize the thrust estimate of Adibhatla (2) in the Adibhatla–Smith method because Adibhatla (2) estimates engine faults by measuring

engine quantities at a first and second operating conditions (see col. 1, lines 35–41) and/or using model-based values at a first and second operating conditions (see col. 1, lines 41–43), and as a result, Adibhatla (2) reports that his fault estimation systems and methods provide the advantage of detecting a fault during the cycle in which it occurs, or a few cycles later, by using inputs acquired during a single flight or two separate flights or cycles (see col. 4, lines 23–27).

25. Claims 3–10, 23–30, and 44–47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adibhatla taken in view of Smith as applied to claims 1, 21, and 41 above, and further in view of Bernier et al., (Bernier hereinafter), U.S. Patent 4,215,412 A:

26. As to claims 3–6, 23–26, and 44–47 while the Adibhatla–Smith method teaches enhancing a model of an aircraft by computing a thrust estimate from data measured from at least one engine sensor, the Adibhatla–Smith method fails to disclose engine sensor data as N1, N2, EPR and/or PLA data.

27. Bernier discloses a method wherein the engine performance data is N1, N2, EPR and/or PLA data. (See col. 34, lines 67–68 and col. 35, lines 1–17).

28. Adibhatla, Smith, and Bernier are analogous art because they are related to flight management systems.

29. Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to utilize the engine performance data of Bernier in the

Adibhatla–Smith method because Bernier provides a highly accurate system for real-time monitoring of the performance parameters of a gas turbine engine (see col. 4, lines 55–65), and as a result, Bernier reports improving over his prior art by addressing sensor inaccuracies or signal noise commonly encountered with commercially available pressure and temperature sensors (see col. 4, lines 35–39) and maintaining accuracy over a wide range of steady state engine operating conditions encountered in the normal operation of the aircraft (see col. 6, lines 41–45).

30. As to claims 7 and 27, Adibhatla discloses capturing at least one input parameter other than the thrust estimate (see "rotor speeds, temperatures, and pressures" in col. 2, lines 58–63) and notifying a pilot of a possible error if the input parameter is not within the valid data range (see col. 4, lines 6–8). Bernier discloses retrieving a valid data range for the one input parameter (see "predicted engine performance parameters" in col. 5, lines 28–31 and "Y" in col. 5, lines 45–51); comparing the one input parameter to the valid data range for the input parameter (see "Within the difference unit, the signals are compared" in col. 7, lines 10–24) and using the input parameter for the mathematical model if it is within the valid data range (see "monitoring logic" in col. 7, lines 10–24).

31. Claims 7 and 27 have been given a broad reasonable interpretation by the Examiner. The Examiner notes that the step disclosed in (Adibhatla col. 4, lines 6–8 and Bernier col. 7, lines 10–24) is functionally equivalent to the results produced by the step expressly claimed in Applicant's dependent claims 7 and 27. Therefore, the "product"

that is produced by performing the step disclosed in dependent claims 7 and 27 is the functional equivalent of the "product" that is produced in (Adibhatla col. 4, lines 6–8 and Bernier col. 7, lines 10–24). Although the "step" by which the end result is different, the final result for the "step" is identical.

32. As to claims 8 and 28, Adibhatla discloses a method further comprising taking an action other than notifying a pilot of a possible error if the input parameter is not within the valid data range. (See "alerts such as" in col. 4, lines 6–8).

33. As to claims 9 and 29, Smith discloses a method wherein the action other than notifying a pilot of a possible error comprises updating a database if the input parameter is not within the valid data range. (See "save the data" in col. 4, lines 13–24).

34. Claims 9 and 29 have been given a broad reasonable interpretation by the Examiner. The Examiner notes that the step disclosed in (col. 4, lines 13–24) is functionally equivalent to the results produced by the step expressly claimed in Applicant's dependent claims 9 and 29. Therefore, the "product" that is produced by performing the step disclosed in dependent claims 9 and 29 is the functional equivalent of the "product" that is produced in (col. 4, lines 13–24). Although the "step" by which the end result is different, the final result for the "step" is identical.

35. As to claims 10 and 30, Adibhatla discloses a method wherein the input parameter is sensor data. (See Fig. 1, item Nos. 20 and 68).

36. Claims 11–20 and 31–40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adibhatla taken in view of Smith, further in view of Bernier as applied to claims 1, 7, 21, and 27 above, and further in view of Chakravarty, (Chakravarty hereinafter), U.S. Patent 5,457,634 A.

37. As to claim 11, while the Adibhatla–Smith–Bernier method teaches enhancing a model of an aircraft by computing a thrust estimate from data measured from at least one engine sensor, the Adibhatla–Smith–Bernier method fails to disclose having the pilot enter input parameter data.

38. Chakravarty discloses a method wherein the input parameter is pilot entered data. (See col. 1, lines 46–48 and col. 7, lines 12–16).

39. Adibhatla, Smith, Bernier, and Chakravarty are analogous art because they are related to flight management systems.

40. Therefore, it would have been obvious to one of ordinary skill in this art at the time of invention by applicant to utilize the pilot entered data of Chakravarty in the Adibhatla–Smith–Bernier method because Chakravarty uses his airborne flight management computer system which responds to an input (see col. 1, lines 10–13), and as a result, Chakravarty reports the following improvements over his prior art: producing optimum trajectory and thrust settings to achieve a desired time of arrival and flying aircraft in optimum cost effective conditions (see col. 1, lines 14–33).

41. As to claim 12, Chakravarty discloses capturing the values of at least two aircraft sensors that measure the same type of data (see "redundant sensors" in col. 6, lines

58–60); retrieving a tolerance that represents an error for the type of data and comparing the values of each of the sensors that measure the same type of data to each other (see Fig. 3, item No. 86). Adibhatla discloses notifying the pilot of a possible error if any two of the sensors that measure the same type of data vary by more than the tolerance that represents an error for the type of data (see col. 4, lines 6–8). Bernier discloses using the data measured from at least one of the sensors that measure the same type of data for the mathematical model if no two of the sensors that measure the same type of data vary by more than the tolerance that represents an error for the type of data (see "monitoring logic" in col. 7, lines 10–24).

42. Claim 12 has been given a broad reasonable interpretation by the Examiner. The Examiner notes that the step disclosed in (Adibhatla col. 4, lines 6–8 and Bernier col. 7, lines 10–24) is functionally equivalent to the results produced by the step expressly claimed in Applicant's dependent claim 12. Therefore, the "product" that is produced by performing the step disclosed in dependent claim 12 is the functional equivalent of the "product" that is produced in (Adibhatla col. 4, lines 6–8 and Bernier col. 7, lines 10–24). Although the "step" by which the end result is different, the final result for the "step" is identical.

43. As to claim 13, Adibhatla discloses a method further comprising taking an action other than notifying a pilot of a possible error if any two of the sensors that measure the same type of data vary by more than the tolerance that represents an error for the type of data. (See "alerts such as" in col. 4, lines 6–8).

44. As to claim 14, Chakravarty discloses a method wherein the action other than notifying a pilot of a possible error comprises updating a database if any two of the sensors that measure the same type of data vary by more than the tolerance that represents an error for the type of data. (See “information is then stored” in col. 7, lines 39–40).

45. As to claim 15, Chakravarty discloses determining the values of at least two aircraft sensors that measure the same type of data (see “redundant sensors” in col. 6, lines 58–60). Bernier discloses retrieving a valid data range for the type of data (see “predicted engine performance parameters“ in col. 5, lines 28–31 and “Y” in col. 5, lines 45–51); comparing the values of each of the sensors that measure the same type of data to a valid data range for the type of data (see “Within the difference unit, the signals are compared” in col. 7, lines 10–24); and using the data measured from at least one of the sensors that measure the same type of data for the mathematical model if the at least one of the sensors that measure the same type of data is within the valid data range for the type of data (see “monitoring logic” in col. 7, lines 10–24). Adibhatla discloses notifying the pilot of a possible error if none of the sensors that measure the same type of data has a value that is within the valid data range for the type of data (see col. 4, lines 6–8).

46. Claim 15 has been given a broad reasonable interpretation by the Examiner. The Examiner notes that the step disclosed in (Adibhatla col. 4, lines 6–8 and Bernier col. 7, lines 10–24) is functionally equivalent to the results produced by the step expressly

claimed in Applicant's dependent claim 15. Therefore, the "product" that is produced by performing the step disclosed in dependent claim 15 is the functional equivalent of the "product" that is produced in (Adibhatla col. 4, lines 6–8 and Bernier col. 7, lines 10–24). Although the "step" by which the end result is different, the final result for the "step" is identical.

47. As to claim 16, Adibhatla discloses a method further comprising taking an action other than notifying a pilot of a possible error if at least one of the sensors that measure the same type of data does not have a value that is within the valid data range for the type of data. (See "alerts such as" in col. 4, lines 6–8).

48. As to claim 17, Chakravarty discloses a method wherein the action other than notifying a pilot of a possible error comprises updating a database if at least one of the sensors that measure the same type of data does not have a value that is within the valid data range for the type of data. (See "information is then stored" in col. 7, lines 39–40).

49. As to claim 18, Chakravarty discloses determining the values of at least two aircraft sensors that measure the same type of data (see "redundant sensors" in col. 6, lines 58–60). Bernier discloses retrieving a valid data range for the type of data (see "predicted engine performance parameters" in col. 5, lines 28–31 and "Y" in col. 5, lines 45–51); comparing the values of each of the sensors that measure the same type of data to a valid data range for the type of data (see "Within the difference unit, the signals are compared" in col. 7, lines 10–24); using the data measured from exactly one

of the sensors that measure the same type of data for the mathematical model if the exactly one of the sensors that measure the same type of data is the only sensor reporting data within the valid data range for the type of data (see “monitoring logic” in col. 7, lines 10–24); and using an average of sensor values that measure the same type of data and are within the valid data range for the type of data for the mathematical model (see “normalizing” in col. 13, lines 36–43). Adibhatla discloses notifying the pilot of a possible error if none of the sensors that measure the same type of data have a value that is within the valid data range for the type of data (see col. 4, lines 6–8).

50. Claim 18 has been given a broad reasonable interpretation by the Examiner. The Examiner notes that the step disclosed in (Adibhatla col. 4, lines 6–8 and Bernier col. 7, lines 10–24) is functionally equivalent to the results produced by the step expressly claimed in Applicant’s dependent claim 18. Therefore, the “product” that is produced by performing the step disclosed in dependent claim 18 is the functional equivalent of the “product” that is produced in (Adibhatla col. 4, lines 6–8 and Bernier col. 7, lines 10–24). Although the “step” by which the end result is different, the final result for the “step” is identical.

51. As to claim 19, Adibhatla discloses a method further comprising taking an action other than notifying a pilot of a possible error if at least one of the sensors that measure the same type of data does not have a value that is within the valid data range for the type of data. (See “alerts such as” in col. 4, lines 6–8).

52. As to claim 20, Chakravarty discloses a method wherein the action other than notifying a pilot of a possible error comprises updating a database if at least one of the sensors that measure the same type of data does not have a value that is within the valid data range for the type of data. (See “information is then stored” in col. 7, lines 39–40).

53. As to claim 31, Chakravarty discloses a method wherein the input parameter is pilot entered data. (See col. 1, lines 46–48 and col. 7, lines 12–16).

54. As to claim 32, Chakravarty discloses capturing the values of at least two aircraft sensors that measure the same type of data (see “redundant sensors” in col. 6, lines 58–60); retrieving a tolerance that represents an error for the type of data and comparing the values of each of the sensors that measure the same type of data to each other (see Fig. 3, item No. 86). Adibhatla discloses notifying the pilot of a possible error if any two of the sensors that measure the same type of data vary by more than the tolerance that represents an error for the type of data (see col. 4, lines 6–8). Bernier discloses using the data measured from at least one of the sensors that measure the same type of data for the mathematical model if no two of the sensors that measure the same type of data vary by more than the tolerance that represents an error for the type of data (see “monitoring logic” in col. 7, lines 10–24).

55. Claim 32 has been given a broad reasonable interpretation by the Examiner. The Examiner notes that the step disclosed in (Adibhatla col. 4, lines 6–8 and Bernier col. 7, lines 10–24) is functionally equivalent to the results produced by the step expressly

claimed in Applicant's dependent claim 32. Therefore, the "product" that is produced by performing the step disclosed in dependent claim 32 is the functional equivalent of the "product" that is produced in (Adibhatla col. 4, lines 6–8 and Bernier col. 7, lines 10–24). Although the "step" by which the end result is different, the final result for the "step" is identical.

56. As to claim 33, Adibhatla discloses a method further comprising taking an action other than notifying a pilot of a possible error if any two of the sensors that measure the same type of data vary by more than the percentage that represents an error for the type of data. (See "alerts such as" in col. 4, lines 6–8).

57. As to claim 34, Chakravarty discloses a method wherein the action other than notifying a pilot of a possible error comprises updating a database if any two of the sensors that measure the same type of data vary by more than the percentage that represents an error for the type of data. (See "information is then stored" in col. 7, lines 39–40).

58. As to claim 35, Chakravarty discloses determining the values of at least two aircraft sensors that measure the same type of data (see "redundant sensors" in col. 6, lines 58–60). Bernier discloses retrieving a valid data range for the type of data (see "predicted engine performance parameters" in col. 5, lines 28–31 and "Y" in col. 5, lines 45–51); comparing the values of each of the sensors that measure the same type of data to a valid data range for the type of data (see "Within the difference unit, the signals are compared" in col. 7, lines 10–24); and using the data measured from at least

one of the sensors that measure the same type of data for the mathematical model if the at least one of the sensors that measure the same type of data is within the valid data range for the type of data (see “monitoring logic” in col. 7, lines 10–24). Adibhatla discloses notifying the pilot of a possible error if none of the sensors that measure the same type of data have a value that is within the valid data range for the type of data (see col. 4, lines 6–8).

59. Claim 35 has been given a broad reasonable interpretation by the Examiner. The Examiner notes that the step disclosed in (Adibhatla col. 4, lines 6–8 and Bernier col. 7, lines 10–24) is functionally equivalent to the results produced by the step expressly claimed in Applicant's dependent claim 35. Therefore, the “product” that is produced by performing the step disclosed in dependent claim 35 is the functional equivalent of the “product” that is produced in (Adibhatla col. 4, lines 6–8 and Bernier col. 7, lines 10–24). Although the “step” by which the end result is different, the final result for the “step” is identical.

60. As to claim 36, Adibhatla discloses a method further comprising taking an action other than notifying a pilot of a possible error if at least one of the sensors that measure the same type of data does not have a value that is within the valid data range for the type of data. (See “alerts such as” in col. 4, lines 6–8).

61. As to claim 37, Chakravarty discloses a method wherein the action other than notifying a pilot of a possible error comprises updating a database if at least one of the sensors that measure the same type of data does not have a value that is within the

valid data range for the type of data. (See "information is then stored" in col. 7, lines 39–40).

62. As to claim 38, Chakravarty discloses determining the values of at least two aircraft sensors that measure the same type of data (see "redundant sensors" in col. 6, lines 58–60). Bernier discloses retrieving a valid data range for the type of data (see "predicted engine performance parameters" in col. 5, lines 28–31 and "Y" in col. 5, lines 45–51); comparing the values of each of the sensors that measure the same type of data to a valid data range for the type of data (see "Within the difference unit, the signals are compared" in col. 7, lines 10–24); using the data measured from exactly one of the sensors that measure the same type of data for the mathematical model if the exactly one of the sensors that measure the same type of data is the only sensor reporting data within the valid data range for the type of data (see "monitoring logic" in col. 7, lines 10–24); and using an average of sensor values that measure the same type of data and are within the valid data range for the type of data for the mathematical model (see "normalizing" in col. 13, lines 36–43). Adibhatla discloses notifying the pilot of a possible error if none of the sensors that measure the same type of data have a value that is within the valid data range for the type of data (see col. 4, lines 6–8).

63. Claim 38 has been given a broad reasonable interpretation by the Examiner. The Examiner notes that the step disclosed in (Adibhatla col. 4, lines 6–8 and Bernier col. 7, lines 10–24) is functionally equivalent to the results produced by the step expressly claimed in Applicant's dependent claim 38. Therefore, the "product" that is produced by

performing the step disclosed in dependent claim 38 is the functional equivalent of the "product" that is produced in (Adibhatla col. 4, lines 6–8 and Bernier col. 7, lines 10–24). Although the "step" by which the end result is different, the final result for the "step" is identical.

64. As to claim 39, Adibhatla discloses a method further comprising taking an action other than notifying a pilot of a possible error if at least one of the sensors that measure the same type of data does not have a value that is within the valid data range for the type of data. (See "alerts such as" in col. 4, lines 6–8).

65. As to claim 40, Chakravarty discloses a method wherein the action other than notifying a pilot of a possible error comprises updating a database if at least one of the sensors that measure the same type of data does not have a value that is within the valid data range for the type of data. (See "information is then stored" in col. 7, lines 39–40).

Conclusion

66. Examiner would like to point out that any reference to specific figures, columns and lines should not be considered limiting in any way, the entire reference is considered to provide disclosure relating to the claimed invention.

67. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan C. Ochoa whose telephone number is (571) 272-2625. The examiner can normally be reached on 7:30AM - 4:00 PM.

68. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on (571) 272-3753. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

69. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*** 4/28/06

Paul L. Rodriguez 5/1/06
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